

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-155347

(43)Date of publication of application : 06.06.2000

(51)Int.Cl.

G03B 5/00
H04N 5/232

(21)Application number : 10-332393

(71)Applicant : FUJI PHOTO OPTICAL CO LTD

(22)Date of filing : 24.11.1998

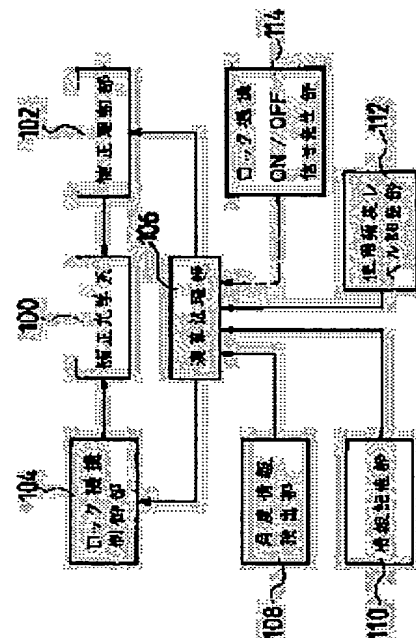
(72)Inventor : YAJIMA SHINYA

(54) IMAGE BLURRING PREVENTING DEVICE FOR TELEVISION LENS

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an image blurring preventing device for television lens capable of preventing the occurrence of irregularities in an image after a panning/tilting operation and reducing power consumption by locking an anti-vibration lens, in the case the image blurring quantity is increased in the same state as the panning/tilting operation.

SOLUTION: In this image blurring preventing device for television lens, the image blurring quantity is detected by the angular velocity sensor of an angle information detecting part 108, then, it is decided by the sensor whether or not the image blurring quantity is below a prescribed threshold value. In the case the image blurring quantity is below the threshold, the correction drive of the anti-vibration lens of a correction optical system 100 is executed based on the image blurring quantity, on the other hand, in the case the image blurring quantity is equal to or exceeding the threshold, the anti-vibration lens is locked by a locking mechanism.



*** NOTICES ***

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.*** shows the word which can not be translated.

3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1]A vibration proof lens which amends image blur produced by vibration added to said television lens by being moved in a field which intersects perpendicularly with an optic axis within a camera cone of a television lens.

A locking mechanism which locks this vibration proof lens.

A vibration detecting means which detects a size of vibration which is an image Bure arrester of a television lens provided with the above, and was added to said television lens, When vibration detected by said vibration detecting means was larger than a predetermined threshold, it had a control means which locks said vibration proof lens according to said locking mechanism.

[Translation done.]

*** NOTICES ***

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention amends image blur produced by vibration which related to the image Bure arrester of the television lens, especially was added to the television lens with a vibration proof lens, and it relates to the image Bure arrester of the television lens which locks said vibration proof lens by a locking mechanism at the time of the needlessness of image Bure amendment.

[0002]

[Description of the Prior Art]Conventionally, if a vibration proof lens is supported in the camera cone of a television lens in the field which intersects perpendicularly with a photographing optical axis, enabling free movement and vibration is added to a camera, the image Bure arrester of the television lens would move the vibration proof lens in the direction which negates the vibration with the actuator, and will have amended image blur. When there is almost no vibration in such a television lens and the vibration proof function is not needed for it when conveying a television lens so that a vibration proof lens moves and may not be damaged within a camera cone and, the locking mechanism for fixing a vibration proof lens to the camera cone side is established.

[0003]If power supply voltage falls to JP,9-80555,A, in order to cancel the fault that a possibility that control of a vibration proof lens may become difficult, and a vibration proof lens may be around contacted and damaged by vibration arises, If power supply voltage falls from a predetermined value, the thing of locking a vibration proof lens automatically is proposed.

[0004]

[Problem(s) to be Solved by the Invention]The time of use of a locking mechanism the conventional image Bure arrester at the time of initial value setting, for example At however, the time of a reset action and conveyance. Or it was restricted like JP,9-80555,A at the time of the loss of control of a vibration proof lens, etc., and in order to acquire the stable picture and to save power consumption, what used the locking mechanism positively was not proposed.

[0005]The thing in particular for which a vibration proof lens is operated at the time of pan tilt operation of a camera is almost meaningless, and the problem that the picture after pan tilt operation finish was confused on the contrary by operation of not only becoming the futility of power consumption but a vibration proof lens had arisen. This invention was made in view of such a situation, and an object of this invention is to provide the image Bure arrester of the television lens which degradation of image quality is prevented, using the locking mechanism of a vibration proof lens positively when image Bure amendment is unnecessary, and aims at saving of power consumption.

[0006]

[Means for Solving the Problem]This invention is provided with the following.

A vibration proof lens which amends image blur produced by vibration added to said television lens by being moved in a field which intersects perpendicularly with an optic axis within a camera cone of a television lens in order to attain said purpose.

A vibration detecting means which detects a size of vibration added to said television lens in an image Bure arrester of a television lens provided with a locking mechanism which locks this vibration proof lens.

A control means which locks said vibration proof lens according to said locking mechanism when vibration detected by said vibration detecting means is larger than a predetermined threshold.

[0007]According to this invention, vibration added to a television lens like [at the time of pan tilt

operation of a television camera], for example is very large to a degree, Without a vibration proof lens causing unusual operation by such big vibration, in order to lock a vibration proof lens according to a locking mechanism when it is said that it is meaningless as image Bure amendment, even if it operates a vibration proof lens, disorder of a picture is prevented and it also becomes saving of power consumption. Fault that a vibration proof lens is damaged by big vibration is also prevented.

[0008]

[Embodiment of the Invention]The desirable embodiment of the image Bure arrester of the television camera applied to this invention according to an accompanying drawing below is explained in full detail. Drawing 1 is a front view showing the embodiment of the amendment optical system of the image Bure arrester of the television camera concerning that of this invention. As shown in the figure, in the camera cone 10 of a television lens, the vibration proof lens 12 is held and arranged at the lens frame object 14. This vibration proof lens 12 is moved in the direction which amends image blur in the field which intersects perpendicularly with the photographing optical axis L with the linear motors 16 and 18. The vibration proof lens 12 is supported by the camera cone 10 via the parallel linkage which consists of the four arms 20 and 22, enabling free movement.

[0009]The linear motor 16 moves the vibration proof lens 12 rightward [left-in-the-figure], and comprises the motor body 16A and the rod 16B. The motor body 16A is fixed to the camera cone 10, and the tip of said rod 16B is engaging with the long hole 24 of the lens frame object 14 via the roller 26. Said long hole 24 is formed in the left side part of the lens frame object 14 figure Nakagami down, and, therefore, the long hole 24 and the roller 26 are engaging with figure Nakagami down relatively, enabling free movement.

[0010]If the rod 16B of the motor body 16A carries out an expanding action, the lens frame object 14 will be pushed on the rod 16B, or will be pulled to the rod 16B, and will move to the drawing 1 top longitudinal direction. If the power of a sliding direction is added to the lens frame object 14, the long hole 24 will be guided to the roller 26, and the vibration proof lens 12 will move to a sliding direction. The connecting frame 28 has adhered to the rod 16B of said linear motor 16. This connecting frame 28 is allocated in a sliding direction, said rod 16B adheres to a center section, and the upper-and-lower-ends part is slidably supported by the linear guides 30 and 30, respectively. Said linear guides 30 and 30 are formed in parallel with the rod 16B, and if the rod 16B is expanded and contracted by this, they will carry out parallel translation of said connecting frame 28 to right and left, with the posture held.

[0011]Press contact of the tip of the contact needle 32B for detection of the position sensing device 32 is carried out to said connecting frame 28. The sensor body 32A is fixed to the camera cone 10 by the position to which said contact needle 32B for detection becomes parallel to the rod 16B, and said position sensing device 32 detects the movement magnitude of the connecting frame 28 which carries out parallel translation by the expanding action of the rod 16B. The position sensing device 32 of this embodiment does not make the contact needle 32B for detection contact the peripheral surface of the lens frame object 14 directly, but is made to contact the connecting frame 28 which can detect the movement magnitude of the vibration proof lens 12 indirectly. Since parallel translation of the connecting frame 28 is carried out holding a posture regardless of the amount of elasticity of the rod 16B as mentioned above, during the movement, the contact needle 32B for detection shifts from the connecting frame 28, or it is not slippery.

[0012]The numerals 34A are the bobbins which constitute the speed generator 34, the numerals 34B are cores which constitute the speed generator 34, and this core 34B has adhered to the connecting frame 28. On the other hand, the linear motor 18 moves the vibration proof lens 12 to a sliding direction, and comprises the motor body 18A and the rod 18B. The motor body 18A is fixed to the camera cone 10, and the tip of said rod 18B is engaging with the long hole 36 of the lens frame object 14 via the roller 38. Said long hole 36 is formed in a longitudinal direction at the lower part of the lens frame object 14, and, therefore, the long hole 36 and the roller 38 are engaging with the longitudinal direction relatively, enabling free movement.

[0013]If the rod 18B carries out an expanding action with the driving force of the motor body 18A, the lens frame object 14 will be pushed on the rod 18B, or will be pulled to the rod 18B, and will move to a sliding direction. If the power of a longitudinal direction is added to the lens frame object 14, the long hole 36 will be guided to the roller 38, and the vibration proof lens 12 will move to a longitudinal direction. The connecting frame 40 adheres to the rod 18B of said linear motor 18. The connecting frame 40 is allocated in a longitudinal direction, said rod 18B adheres

to a center section, and the right-and-left-ends part is slidably supported by the linear guides 42 and 42, respectively. Said linear guides 42 and 42 will carry out parallel translation of said connecting frame 40 up and down, with the posture held, if it is provided in parallel with the rod 18B and the rod 18B is expanded and contracted by this.

[0014]Press contact of the tip of the contact needle 44B for detection of the position sensing device 44 is carried out to said connecting frame 40. The sensor body 44A is fixed to the camera cone 10 by the position to which the contact needle 44B for detection becomes parallel to the rod 18B, and the position sensing device 44 detects the movement magnitude of the connecting frame 40 which carries out parallel translation by the expanding action of the rod 18B. This position sensing device 44 does not make the contact needle 44B for detection contact the peripheral surface of the lens frame object 14 directly, either, but is made to contact the connecting frame 40 which can detect the movement magnitude of the vibration proof lens 12 indirectly. [as well as the position sensing device 32] Since parallel translation of the connecting frame 40 is carried out holding a posture regardless of the amount of elasticity of the rod 18B, during the movement, the contact needle 44B for detection shifts from the connecting frame 40, or it is not slippery.

[0015]The numerals 46A are the bobbins which constitute the speed generator 46, the numerals 46B are cores which constitute the speed generator 46, and this core 46B has adhered to the connecting frame 40. Drawing 2 is an important section sectional view showing the embodiment of the locking mechanism of said vibration proof lens 12. The locking mechanism shown in the figure comprises the lock rings (compression member) 50 and 52 of a couple, and the drive ring 54. Said lock ring 50 is ahead arranged to the optic axis L of the lens frame object 14 of the vibration proof lens 12, and the lock ring 52 is back arranged to the optic axis L of said lens frame object 14.

[0016]The hole 56 is formed in said lock rings 50 and 52 in parallel with the optic axis L, respectively. Several places of this hole 56 are formed in the surface of the lock rings 50 and 52 at the predetermined intervals, and the pin 58 and 58 — which protruded on this hole 56 and 56 — from the camera cone 10 side are inserted loosely. Therefore, said lock rings 50 and 52 are supported by the camera cone 10 via said pin 58 and 58 —, and are guided to the pin 58 and 58 —, and are arranged in the direction of optic-axis L, enabling free back and forth movement. The moving stroke of the lock rings 50 and 52 is set up between the position which can fully carry out compression maintenance of the lens frame object 14 in the lock rings 50 and 52, and the position as for which the specified quantity separates from the lens frame object 14.

[0017]The HEIRIKOIDO screw thread 60 is formed in the peripheral face of said lock ring 50, and this helicoid screw thread 60 is screwed in the helicoid screw thread 62 formed in the front-sides inner skin of said drive ring 54. The helicoid screw thread 64 is formed also in the peripheral face of the lock ring 52, and this helicoid screw thread 64 is screwed in the helicoid screw thread 66 formed in the back side inner skin of the drive ring 54. Therefore, if the drive ring 54 is rotated to one way, the lock rings 50 and 52 will move in the direction which approaches mutually by an operation of said helicoid screw thread and rectilinear-propagation operation of the pin 58. If the drive ring 54 is rotated for another side, the lock rings 50 and 52 can move in the direction which keeps away mutually by said operation. A gear is formed in the peripheral face 54A of said drive ring 54, and the drive ring 54 rotates with the driving force of the drive motor (not shown) which engages with this gear.

[0018]By the way, as for the compression supporter 68 of the lock ring 50, the drawing 2 top lower left is formed in the tapered surface of **. As for the contact part 70 of the lens frame object 14 which counters this compression supporter 68, the lower left is similarly formed in the tapered surface of **. On the other hand, the lower right is similarly formed in the tapered surface of ** for the contact part 74 of the lens frame object 14 in which the drawing 2 top lower right is formed in the tapered surface of **, and the compression supporter 72 of the lock ring 52 counters this compression supporter 72. Therefore, if the lock rings 50 and 52 move in the direction which approaches mutually, in the compression supporter 68, the contact part 70 and the compression supporter 72 will carry out press contact to the contact part 74. And the lens frame object 14 is guided to the tapered surface of the compression supporters 68 and 72 by movement which the lock rings 50 and 52 continue, and fine amount movement is carried out. And the optic axis of the vibration proof lens 12 is set by the optic axis L of the whole optical system. Thus, said tapered surface is formed.

[0019]Therefore, according to the locking mechanism constituted like the above, rotating operation of the drive ring 54 is carried out, the lock rings 50 and 52 of a couple are moved in

the direction which approaches mutually, and compression maintenance of the lens frame object 14 of the vibration proof lens 12 is carried out from the optic-axis L order by the lock rings 50 and 52. Thereby, the vibration proof lens 12 can easily and certainly be locked.

[0020] Drawing 3 is a block diagram showing the composition of the image Bure arrester of the television lens concerning this invention. The amendment optical system 100 shown in the figure shows the mechanism to which the vibration proof lens 12 and the vibration proof lens 12 which were shown in above-mentioned drawing 1 are moved in the field which intersects perpendicularly with the photographing optical axis L, and the correction driving part 102 is a circuit which drives the linear motors 16 and 18 shown in drawing 1, and carries out correction driving of the vibration proof lens 12. The locking mechanism control section 104 is a circuit which controls the drive motor made to rotate the drive ring 54 shown in above-mentioned drawing 2, by rotating the drive ring 54 (lock drive), locks the vibration proof lens 12 of the amendment optical system 100, or cancels the lock.

[0021] A control signal is inputted from the arithmetic processing section 106, and these correction driving parts 102 and locking mechanism control sections 104 are controlled by this. The arithmetic processing section 106 acquires various data from the angle information primary detecting element 108, the information storage part 110, the frequency-in-use level adjustment part 112, and the locking mechanism ON/OFF signal generator 114. Based on this, a control signal is outputted to the correction driving part 102 and the locking mechanism control section 104, and the correction driving of the vibration proof lens 12 and a lock drive are controlled.

[0022] The above-mentioned angle information primary detecting element 108 consists of two angular velocity sensors for detecting the amount of image Bure, and these are installed in the flank and the upper part of the camera cone 10 of a television lens, for example. The angular velocity sensor installed in the flank of the camera cone 10 of a television lens detects the angular velocity of the longitudinal-direction ingredient produced by vibration transmitted to the camera cone 10, and inputs this detected signal into the arithmetic processing section 106. On the other hand, the angular velocity sensor installed in the upper part of the camera cone 10 of a television lens detects the angular velocity of the sliding direction ingredient produced by vibration transmitted to the camera cone 10, and inputs this detected signal into the arithmetic processing section 106.

[0023] The arithmetic processing section 106 computes based on the angular velocity of these upper and lower sides detected with each angular velocity sensor of the angle information primary detecting element 108, and a longitudinal direction, the size of image Bure, i.e., amount, of vibration. And the amendment movement magnitude of the longitudinal direction which should be given to the vibration proof lens 12 based on these amounts of image Bure is computed, and a control signal is outputted to the correction driving part 102 based on this. Data required to compute the amendment movement magnitude of this vibration proof lens 12 is recorded on the information storage part 110, and the arithmetic processing section 106 performs the above-mentioned calculation with reference to this data.

[0024] On the other hand, the arithmetic processing section 106 measures with a predetermined threshold the amount of image Bure computed as mentioned above. A user can change this threshold now suitably by the frequency-in-use level adjustment part 112. And when it is judged as a result of comparison that the amount of image Bure is larger than said threshold, the correction driving of the vibration proof lens 12 is suspended, and a control signal is outputted to the locking mechanism control section 104, and the vibration proof lens 12 is locked. That is, the time of pan tilt operation of a television camera, and when such a big vibration that image Bure cannot be prevented has arisen, he is trying for the arithmetic processing section 106 to lock the vibration proof lens 12 automatically. Thereby, disorder of the image quality after pan tilt operation is prevented, and saving of power consumption is achieved.

[0025] The above-mentioned locking mechanism ON/OFF signal generator 114, When a user directs the lock of the vibration proof lens 12 with a predetermined operation switch and the lock of the vibration proof lens 12 is directed by this, the arithmetic processing section 106 makes the locking mechanism control section 104 lock the vibration proof lens 12 irrespective of the size of the amount of image Bure. Drawing 4 is the flow chart which showed the procedure of the above-mentioned arithmetic processing section 106. First, the arithmetic processing section 106 detects the amount of image Bure based on the angular velocity signal of the upper and lower sides and a longitudinal direction inputted from the angle information primary detecting element 108 (Step S10).

[0026] Next, it judges whether the arithmetic processing section 106 has the amount of image

Bure smaller than the predetermined threshold adjusted by the frequency-in-use level adjustment part 112, and it is judged whether correction driving of the vibration proof lens 12 is carried out, and image Bure is amended (Step S12). When it judges with YES (i.e., when the amount of image Bure is smaller than said threshold), based on the amount of image Bure, the amendment movement magnitude of the vibration proof lens 12 is computed, and the correction driving part 102 is made to perform correction driving of the vibration proof lens 12 by this decision processing based on this (Step S14).

[0027]On the other hand, when it judges with NO (i.e., when the amount of image Bure is beyond said threshold), the locking mechanism control section 104 is made to perform a lock drive, and a vibration proof lens is made to lock by the above-mentioned decision processing (Step S16). image Bure amendment is performed for the above processing — between repeat execution is carried out. When it judges with YES at Step S12 once locking the vibration proof lens 12 in Step S16 (i.e., when carrying out correction driving of the vibration proof lens 12), naturally the lock of the vibration proof lens 12 is canceled.

[0028]As mentioned above, in the above-mentioned embodiment, although the image Bure arrester of the television lens was explained, this invention is applicable as an image Bure arrester of the camera of arbitrary kinds, such as not only this but a still camera. The amendment optical system and locking mechanism of an image Bure arrester are not restricted to what was shown in drawing 1 and drawing 2 on application of this invention. When the signal which shows that pan tilt operation is performed is detected, it may be made have locked the vibration proof lens in the above-mentioned embodiment, when the amount of image Bure was larger than a predetermined threshold, but to lock the vibration proof lens 12. For example, when the television camera is carried in the camera platform operated by a remote controller, it can detect that the command signal of pan tilt operation was transmitted from the remote controller, and the vibration proof lens 12 can be locked.

[0029]

[Effect of the Invention]According to the image Bure arrester of the television lens applied to this invention as explained above. For example, vibration added to the television lens like [at the time of pan tilt operation of a television camera] is very large to a degree, Without a vibration proof lens causing unusual operation by such big vibration, in order to lock a vibration proof lens according to a locking mechanism when it is said that it is meaningless as image Bure amendment, even if it operates a vibration proof lens, disorder of a picture is prevented and it also becomes saving of power consumption. The fault that a vibration proof lens is damaged by big vibration is also prevented.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]Drawing 1 is a front view of the vibration proof lens in which the image Bure arrester of the television lens concerning this invention was applied.

[Drawing 2]Drawing 2 is an important section sectional view showing the embodiment of the locking mechanism of a vibration proof lens.

[Drawing 3]Drawing 3 is a block diagram showing the composition of the image Bure arrester of the television lens concerning this invention.

[Drawing 4]Drawing 4 is the flow chart which showed the procedure of the arithmetic processing section.

[Description of Notations]

10 — Camera cone

12 — Vibration proof lens

16, 18 — Linear motor

100 — Amendment optical system

102 — Correction driving part

104 — Locking mechanism control section

106 — Arithmetic processing section

108 — Angle information primary detecting element

110 — Information storage part

[Translation done.]

(10) 日本国特許庁 (J P) (12) 公開特許公報 (A) (11) 特許出願公開番号
特開2000-155347
(P2000-155347A)
(43) 公開日 平成12年6月6日(2000.6.6)

(51) Int.Cl. ⁷	識別記号	P I	サーチコード(参考)
G 0 3 B 5/00		G 0 3 B 5/00	J 5 C 0 2 2
H 0 4 N 5/232		H 0 4 N 5/232	Z

審査請求 未請求 請求項の数 1 O L (全 6 頁)

(21) 出願番号	特願平10-332383	(71) 出願人	000005430 富士写真光機株式会社 埼玉県大宮市越竹町1丁目324番地
(22) 出願日	平成10年11月24日(1998.11.24)	(72) 発明者	矢島 信雄 埼玉県大宮市越竹町1丁目324番地 富士 写真光機株式会社内
		(74) 代理人	100083110 弁理士 松浦 肇三 Fターム(参考) 5C022 AB45 AB55 AB87 AC00 AC27 AC54 AC78

(54) 【発明の名称】 テレビレンズの像ブレ防止装置

(67) 【要約】

【課題】 パン・チルト動作時のように像ブレ量が大きい場合に防振レンズをロックして、パン・チルト動作後の画像の乱れを防止すると共に消費電力の節約を図るアレビレンズの像ブレ防止装置を提供する。

【解決手段】 本発明のアレビレンズの像ブレ防止装置は、角速度情報出力108の角速度センサにより、像ブレ量を検出し、その像ブレ量が所定の閾値より小さい場合にかつおかを判定する。像ブレ量が閾値より小さい場合は、像ブレ量に基づいて、補正光学系100の防振レンズ12を相対正駆動し、像ブレ量が閾値以上の場合には防振レンズ12をロック機構によりロックする。

【特許請求の範囲】

【請求項1】 テレビレンズの鏡筒内で光軸と直交する面内で移動されることにより、前記テレビレンズに加わった振動によって生じる像ぶれを補正する防振レンズと、該防振レンズをロックするロック機構とを備えたテレビレンズの像ブレ防止装置において、

前記テレビレンズに加わった振動の大きさを検出する振動検出手段と、

前記振動検出手段によって検出された振動が所定の閾値より大きい場合には前記ロック機構により前記防振レンズをロックする制御手段と、

前記振動検出手段によって検出された振動が所定の閾値を備えたことを特徴とするテレビレンズの像ブレ防止装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明はテレビレンズの像ブレ防止装置に係り、特にテレビレンズに加わった振動によって生じる像ぶれを防振レンズで補正すると共に、像ブレ補正の不要時には前記防振レンズをロック機構でロックするアレビレンズの像ブレ防止装置に関する。

【0002】

【従来の技術】 従来、テレビレンズの像ブレ防止装置は、防振レンズをテレビレンズの鏡筒内に撮影光軸と直交する面内で移動自在に支持し、カメラに振動が加わることで移動させて像ぶれを補正している。また、このようにテレビレンズには、テレビレンズを駆動する時に防振レンズが鏡筒内で動いて損傷しないように、また、振動が殆どなく防振機構を必要としない時に、防振レンズを鏡筒内に固定するためのロック機構が設けられている。

【0003】 特開平9-80555号公報には、電源電圧が低下すると、防振レンズの駆動が固定となり、振動によって防振レンズが面内に接触して破損する恐れが生じるという不具合を解消するため、電源電圧が所定値より低下すると、自動的に防振レンズをロックするというものが提案されている。

【0004】

【発明が解決しようとする課題】 しかしながら、従来の像ブレ防止装置は、ロック機構の使用時が、例えば、初駆動時、リセット動作、運搬時、又は、特開平9-80555号公報のように防振レンズの制御不能時等に限定されており、安定した画像を取得するためや消費電力を節約するためにロック機構を積極的に使用するようにしたものは提案されていない。

【0005】 特に、カメラのパン・チルト動作時に防振レンズを動作させることはあまり意味がなく、消費電力の無駄になるばかりか防振レンズの動作によってパン・チルト動作終了後の画像が却って乱れるといった問題が生じていた。本発明はこのような事情に鑑みてなされた

もので、像ブレ補正が不要な場合に防振レンズのロック機構を積極的に使用して画像の劣化を防止すると共に消費電力の節約を図るテレビレンズの像ブレ防止装置を提供することを目的とする。

【0006】

【課題を解決するための手段】 本発明は、前記目的を達成するために、テレビレンズの鏡筒内で光軸と直交する面内で移動されることにより、前記テレビレンズに加わった振動によって生じる像ぶれを補正する防振レンズと、該防振レンズをロックするロック機構とを備えたテレビレンズの像ブレ防止装置において、前記テレビレンズに加わった振動の大きさを検出する振動検出手段と、前記振動検出手段によって検出された振動が所定の閾値より大きい場合には前記ロック機構により前記防振レンズをロックする制御手段と、を備えたことを特徴としている。

【0007】 本発明によれば、例えばテレビカメラのパン・チルト動作時のようにテレビレンズに加わった振動が極度に大きく、防振レンズを動作させても像ブレ補正として意味がないといった場合に、ロック機構により防振レンズをロックするようにしたため、このように大きな振動によって防振レンズが異常な動作を起こすこともなく、画像の乱れが防止され、消費電力の節約にもなる。さらに、大きな振動によって防振レンズが破損するといった不具合も防止される。

【0008】

【発明の實施の形態】 以下格付図面に従って本発明に係るテレビカメラの像ブレ防止装置の好ましい実施の形態を詳述する。図1は、本発明に係るテレビカメラの像ブレ防止装置の補正光学系の概略の形態を示した正面図である。図面に示すようにテレビレンズの鏡筒10内には、防振レンズ12がレンズ本体14に保持されて配置される。この防振レンズ12は、リニアモータ16、18によって撮影光軸と直交する面内で像ぶれを補正する方向に移動される。また、防振レンズ12は、4本のアーム20、22からなる平行リンク機構を介して鏡筒10に移動自在に支持されている。

【0009】 リニアモータ16は、防振レンズ12を図10から図11の方向に移動させるもので、モータ本体16A、及びロッド16Bから構成される。モータ本体16Aは、鏡筒10に固定され、前記ロッド16Bの先端は防振レンズ本体14の長孔24にローラ26を介して係合されている。前記長孔24は防振レンズ本体14の左側面に図中上下方向に形成され、よって、長孔24とローラ26とは相対的に図中上下方向に移動自在に係合されている。

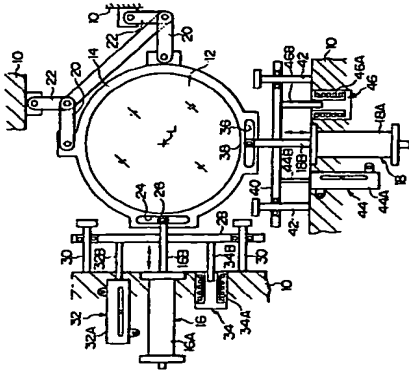
【0010】 モータ本体16Aのロッド16Bは伸縮動作すると、レンズ本体14はロッド16Bに押されて、又はロッド16Bに引かれて図1上左右方向に移動する。また、レンズ本体14は上下方向の力が加わると、長孔24がローラ26にガイドされて防振レンズ12が

後にステップS12でYESと判定した場合、即ち、防振レンズ12を修正駆動させる場合には、当然、防振レンズ12のロックを解除する。

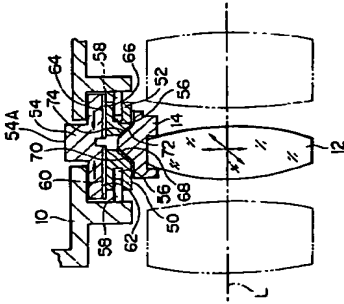
100281以上、上記装置の形態では、テレピンレンズ12の像ブレ防止装置については、本発明は、これに際してカメラ母体の任意の種類のカメラの像ブレ防止装置として適用できる。また、本発明の適用上、像ブレ防止装置の修正光学系及びロック機構は、図1、図2に示したものに限らない。また、上記装置の形態では、像ブレ量が所定の閾値より大きい場合には、防振レンズをロックするようにしたが、パン・チルト動作を行っていることを示す信号を検出した場合に防振レンズ12をロックするようにしてもよい。例えば、リモートコントローラによって操作される場合にテレピンカメラが搭載されている場合においては、リモートコントローラからパン・チルト動作の指令信号が送信されたことを検出して防振レンズ12をロックすることができる。

【0029】
【発明の効果】以上説明したように本発明に係るテレピンレンズの像ブレ防止装置によれば、例えばテレピンカメラのパン・チルト動作時にテレピンレンズに加わった振動が程度に大きく、防振レンズを動作させても像ブレ修正として意味がないといった場合に、ロック機構により防振レンズをロックするようにしたため、このような

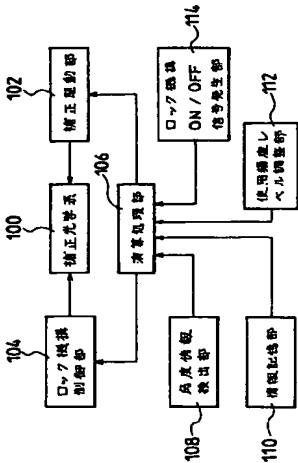
【図1】



【図2】



【図3】



【図4】

